

REMARKS

Applicants have carefully considered the April 19, 2005 Office Action regarding the above-identified application. The amendments to the specification and abstract as well as the claim amendments and the remarks that follow are presented in a bona fide effort to respond thereto and address all issues raised in that Action. Prompt favorable reconsideration of this amended application is requested.

In section 3, the Detailed Action requested Applicant's cooperation in correcting any errors in the specification. In response, a number of editorial revisions have been made to the specification and the abstract, to generally improve the clarity and grammatical accuracy of the amended portions of the application text. Such editorial revisions, however, should not change the meaning of any of the description, therefore the specification and abstract amendments should not introduce new subject matter.

The claims have been amended to more clearly distinguish over art applied in the Office Action. Several of the limitations added to the independent claims are moved up from original dependent claims, and as such, find support in the original claims and supporting disclosure. For example, the first and second optical amplifiers added to claim 1 previously appeared in dependent claim 4, whereas original claim 2 recited an add drop portion.

Other elements added to the independent claims should find clear support in the original drawings and description. Continuing with the example of claim 1, the new paragraph regarding the controller for controlling the amplifiers based on wavelength numbers finds support in the detailed description of application Fig. 8 (running from line 9 of page 19 to line 10 of page 23). The computation of number of wavelengths recited in the last several lines of the claim corresponds to Equation 1 shown in lines 6-10 on page 23. Gain tilt compensation, as now included in claims 5 and 12, previously appeared in several dependent claims, see e.g. original

claims 6 and 7. The present disclosure teaches that the pre-stored data relates to gain tilt characteristics of the optical amplifier as now specified in claims 5 and 12. For example, the disclosure suggests that the gain tilt characteristic of the amplifying doped fiber 1100-5 responsive to the input light power is previously acquired by measurement, simulation or the like, and it is stored in a parameter memory. Then, the controller 1100-9 controls the gain tilt of amplifying doped fiber 1100-5 based on the observed optical power of the input light, using the stored characteristic data. Attention is directed to the paragraph beginning in line 22 of page 25 of the specification.

It is respectfully submitted that the added claim language is fully supported in the original application papers.

The Examiner objected to the phrase "said light is received as defined above" as indefinite. By amendment above, Applicant has delete "as defined above" from this phrase. It should be clear that the paragraph is referring to a time when "said light is received." Withdrawal of the objection to claim 12 is respectfully requested.

The other issues raised in the Action relate to art rejections. Claims 1, 4, 5 and 12 were rejected under 35 U.S.C. §102(b) as anticipated by U.S. Application Publication No. 2001/0024544 to Matsuoka et al. (hereinafter Matsuoka). Claims 1-5 and 12 were rejected under 35 U.S.C. §102(b) as anticipated by U.S. Patent No. 5,943,151 to Grasso et al. (hereinafter Grasso). The Examiner rejected claims 6-11 under 35 U.S.C. §103 as obvious over each of two alternative combinations. The first obviousness rejection combined Matsuoka with U.S. Application Publication No. 2002/015695 to DeGrange, Jr. et al. (hereinafter DeGrange). The other obviousness rejection combined Grasso with the DeGrange publication. Independent

claims 1, 5 and 12 have been amended to clearly recite novel and unobvious distinctions over the three applied documents and combinations thereof. A more detailed explanation follows.

Claim 1, for example, now recites the first and second optical amplifiers and a controller for controlling the amplifier in response to numbers of wavelengths. The first number used is the number of wavelengths in the received wavelength-division multiplexed light. The second number used for control purposes is the number of wavelengths computed by subtracting number of dropped wavelengths from the first wavelength number and adding thereto the number of wavelengths added by the add drop portion. It is respectfully submitted that none of the applied documents discloses such amplifier control based on numbers of wavelengths. Since the control based on wavelength number is absent from both Matsuoka and Grasso, claim 1 should be novel over those applied documents. DeGrange is cited for other features, and it is believed that DeGrange also fails to teach the recited control based on wavelength numbers. Hence, claim 1 patentably distinguishes over the combination of Matsuoka with DeGrange and over the combination of Grasso with DeGrange. It is therefore submitted that claim 1 and dependent claim 13 are patentable.

Claim 13 also further distinguishes over the applied art. New claim 13 recites that the first number of wavelengths is extracted from an optical supervisory channel signal included in the first wavelength-division multiplexed light. It is submitted that none of the applied documents suggests obtaining this wavelength number from an optical supervisory channel signal.

Claims 5 and 12 have been amended to include recitations, of somewhat different scope, regarding gain tilt compensation. Previous claims that included gain tilt compensation recitations were not included in the anticipation rejections over Matsuoka and Grasso, as the Examiner

acknowledged that neither of those documents suggested gain tilt compensation. Hence, the anticipation rejections of claims 5 and 12 should no longer apply to the amended versions of these claims, and the claims should be novel over Matsuoka and Grasso.

It is respectfully submitted that the proposed combinations relying on DeGrange for an alleged teaching of gain tilt compensation would not meet the recitations of independent claim 5 or the recitations of independent claim 12. Claim 5 now recites that the control of the gain tilt compensator is “according to an optical power detected by said optical power detector and pre-stored gain tilt characteristics of said optical amplifier.” Claim 12 now specifies a gain tilt compensating step, in which the compensating is “according to said detected optical power and pre-stored gain tilt characteristics of said optical amplifier.” DeGrange does not provide such compensation according to detected optical power **and pre-stored gain tilt characteristics of said optical amplifier**, and each of the combinations that relies on DeGrange for gain tilt compensation fails to meet the claim requirement for that reason.

In DeGrange, the power level and gain profile of the added channels can be controlled to match the power level and gain profile of the signal passing through the add module. The Examiner cited paragraph [0053]-[0055] of DeGrange for a teaching to compare to “pre-stored data,” on page 7 of the Detailed Action. However, the “pre-stored data” discussed in paragraphs [0053]-[0055] relate “Drop Loss,” “Add Loss” and “Through Loss.” However, paragraph [0009] of DeGrange defines these values as follows:

[0009] Another case occurs due to the add loss, drop loss and through loss of the OADM which may have significant values. “Drop Loss” as it is defined herein is the power loss incurred by a signal passing through an OADM module drop path. Likewise, “Add Loss” as it is defined herein is the power loss incurred by a signal passing through an OADM module add path and “Through Loss” is defined herein is the power loss incurred by a signal passing through an OADM module through path.

As shown by the above quotation, the stored data values used by DeGrange are power losses incurred by optical signals passing through the various paths through the OADM module. These stored data values of DeGrange do not relate to gain tilt characteristics of said optical amplifier, as recited in claim 5 and in claim 12.

The Examiner also alleged that DeGrange compensates for gain-tilt in an optical amplifier 60, and pointed to paragraph [0081] of DeGrange's description. The cited paragraph reads:

[0081] The output of the ADM module 30 is preferably optically coupled to an output amp 60 as further shown in FIG. 1. The output amp 60 is preferably a gain-flattened amplifier having a frequency response that substantially flattens the frequency spectrum of the signal output from amp 60. Such gain-flattened amplifiers are generally available and typically include a plurality of amplifier stages, variable optical attenuators, gain flattening filters and the like to impart the relatively flat gain profile. The inventive processing of the added channels which seeks to match the gain and frequency profile of the added channels to the channels passing through the ADM module works particularly well with a gain-flattened output amp 60. The reason is that the amp 60 need not compensate for a different power level or frequency profile for the added channels and can thereby provide a overall flatter gain response for the WDM signal.

As shown above, this teaching of DeGrange's relates to flattening of the frequency spectrum of the signal output from amp 60. The power of signal output from amp 60 is adjusted between a through light and added light shown in Fig.7, and such adjusting is preferred by DeGrange for the output amp 60 to flatten the frequency spectrum of the signal. There are no specific descriptions how to flatten the frequency spectrum of the signal. It is respectfully submitted that this second section of DeGrange does not suggest gain tilt compensation according to detected optical power and pre-stored gain tilt characteristics of said optical amplifier, as recited in claims 5 and 12.

Hence, the proposed combinations of Matsuoka and Grasso with DeGrange do not satisfy all of the recitations of claims 5 and 12. Those independent claims therefore should be patentable over the art, as should dependent claims 8, 14 and 15.

Dependent claim 8 specifies a further distinction, relating to use of wavelength number to control the gain tilt compensation.

New dependent claims 14 and 15 also recite further distinctions over the applied documents. These claims recite that the pre-stored gain tilt characteristics indicate relationships between gain tilt characteristics of the optical amplifier and light power input to the optical amplifier. In an example disclosed in Applicant's specification, the gain tilt characteristic of the amplifying doped fiber 1100-5 in response to the input light power is previously acquired and stored in a parameter memory. Then, the controller 1100-9 controls the gain tilt of amplifying doped fiber 1100-5 based on the observed optical power of the input light, using the stored characteristic data. Attention is again directed to the paragraph beginning in line 22 of page 25 of the specification. It is respectfully submitted that the documents applied in the various art rejections do not suggest gain tilt compensation according to relationships between gain tilt characteristics of the optical amplifier and light power input to the optical amplifier, as in claims 14 and 15.

Upon entry of the above claim amendments, claims 1, 5, 8, and 12-15 are active in this application, all of which should be patentable over the art applied in the Action. It is submitted that all of the claims are in condition for allowance. Accordingly, this case should now be ready to pass to issue; and Applicant respectfully requests a prompt favorable reconsideration of this matter.


Application No.: 10/645,870

It is believed that this response addresses all issues raised in the April 19, 2005 Office Action. However, if any further issue should arise that may be addressed in an interview or obviated by an Examiner's amendment, it is requested that the Examiner telephone Applicant's representative at the number shown below.

To the extent necessary, if any, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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